

IN THE CLAIMS

1. (Previously Presented) An oscillator comprising:

- an active device;
- a substrate;
- a microstrip line formed on the substrate; and
- a cylindrical dielectric block disposed to couple with the microstrip line in a manner that a base surface of the cylindrical dielectric block is substantially parallel to a surface of the substrate on which the microstrip line is formed,

wherein the microstrip line and the cylindrical dielectric block form a resonator, the active device and the resonator are electrically connected with each other, the active device produces a negative resistance in a desired oscillation frequency band, and a resonance frequency of a lowest order mode of the cylindrical dielectric block is lower than a desired oscillation frequency and a resonance frequency band of one of the higher order modes covers the desired oscillation frequency, and

wherein the cylindrical dielectric block is to resonate in at least one of the higher order modes.

2. (Previously Presented) The oscillator according to claim 1, wherein the substrate is a dielectric substrate.

3. (Previously Presented) The oscillator according to claim 1, wherein the active device, the microstrip line, and the cylindrical dielectric block are mounted on the common substrate.

4. (Previously Presented) The oscillator according to claim 2, wherein the active device, the microstrip line, and the cylindrical dielectric block are mounted on the common substrate.

5. (Previously Presented) The oscillator according to claim 1, wherein the active device is mounted on another substrate different from the substrate.

6. (Previously Presented) The oscillator according to claim 2, wherein the active device is mounted on another substrate different from the substrate.

7. (Currently Amended) An oscillator comprising:

- an active device;
- a substrate;
- a microstrip line formed on the substrate; and
- a dielectric block disposed to couple with the microstrip line,

wherein the microstrip line and the dielectric block form a resonator, the active device and the resonator are electrically connected with each other, the active device produces a negative resistance in a desired oscillation frequency band, and a resonance frequency of a lowest order mode of the dielectric block is lower than a desired oscillation frequency and a resonance frequency band of one of the higher order modes covers the desired oscillation frequency, and

wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device, and

~~wherein the cylindrical dielectric block is to resonate in at least one higher order mode.~~

8. (Previously Presented) The oscillator according to Claim 7, wherein the substrate is a dielectric substrate.

9. (Previously Presented) The oscillator according to claim 7, wherein the active device, the microstrip line, and the dielectric block are mounted on the common substrate.

10. (Previously Presented) The oscillator according to claim 8, wherein the active device, the microstrip line, and the dielectric block are mounted on the common substrate.

11. (Previously Presented) The oscillator according to claim 7, wherein the active device is mounted on another substrate different from the substrate.

12. (Previously Presented) The oscillator according to claim 8, wherein the active device is mounted on another substrate different from the substrate.

13. (Previously Presented) A transmitter-receiver module comprising:

a local signal generator; and

an antenna unit connected electrically to the local signal generator,

wherein the local signal generator includes an oscillator, and the oscillator comprises:

an active device;

a substrate;

a microstrip line formed on the substrate; and

a cylindrical dielectric block disposed to couple with the microstrip line in a manner that a base surface of the cylindrical dielectric block is substantially parallel to a surface of the substrate on which the microstrip line is formed,

wherein the microstrip line and the cylindrical dielectric block form a resonator, the active device and the resonator are electrically connected with each other, the active device produces a negative resistance in a desired oscillation frequency band, and a resonance frequency of the lowest order mode of the cylindrical dielectric block is lower

than the desired oscillation frequency and a resonance frequency band of one of the higher order modes covers the desired oscillation frequency, and

wherein the cylindrical dielectric block is to resonate in at least one of the higher order modes.

14. (Previously Presented) The transmitter-receiver module according to claim 13, wherein the substrate is a dielectric substrate.

15. (Previously Presented) The transmitter-receiver module according to claim 13, wherein the active device, microstrip line, and cylindrical dielectric block are mounted on the common substrate.

16. (Previously Presented) The transmitter-receiver module according to claim 13, wherein the active device is mounted on another substrate different from the substrate.

17. (Previously Presented) A radar system comprising:
a local signal generator;

a transmitter antenna connected electrically to the local signal generator;

a mixer connected electrically to the local signal generator; and

a receiver antenna connected electrically to the mixer;

wherein the local signal generator includes an oscillator, and the oscillator comprises:

an active device;

a substrate;

a microstrip line formed on the substrate; and

a cylindrical dielectric block disposed to couple with the microstrip line in a manner that a base surface of the cylindrical dielectric block is substantially parallel to a surface of the substrate on which the microstrip line is formed,

wherein the microstrip line and the cylindrical dielectric block form a resonator, the active device and the resonator are electrically connected with each other, the active device produces a negative resistance in a desired oscillation frequency band, and a resonance frequency of the

lowest order mode of the cylindrical dielectric block is lower than the desired oscillation frequency and a resonance frequency band of one of the higher order modes covers the desired oscillation frequency,

wherein the transmitter antenna radiates a signal generated by the local signal generator as a transmission signal, the receiver antenna receives a reflection signal that the transmission signal is reflected on a target, and the mixer mixes the reflection signal and the signal generated by the local signal generator, and

wherein the cylindrical dielectric block is to resonate in at least one of the higher order modes.

18. (Currently Amended) The ~~oscillator~~ radar system according to claim 17,

wherein the substrate is a dielectric substrate.

19. (Currently Amended) The ~~oscillator~~ radar system according to claim 17,

wherein the active device, the microstrip line, and the cylindrical dielectric block are mounted on the common substrate.

20. (Currently Amended) The ~~oscillator~~ radar system according to claim 17,

wherein the active device is mounted on another substrate different from the substrate.